CURRENT LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Withdrawn) A device for determining the presence of at least one of a plurality of analytes in a sample, the device comprising:

a test zone corresponding to each analyte selected for determining its presence, each test zone receiving and contacting the sample and a labeled indicator reagent corresponding to the selected analyte, the test zone reagent corresponding to the selected analyte reacting in the presence of the sample and the labeled indicator reagent corresponding to the selected analyte to form a corresponding test zone product and a corresponding test zone detectable response inversely related to the selected analyte level in the sample;

a reference zone for receiving from each test zone the labeled indicator reagent not reacted with its corresponding test zone reagent and contacting each labeled indicator reagent with a corresponding reference zone reagent, each reference zone reagent reacting in the presence of the corresponding labeled indicator reagent to form a corresponding reference zone reaction product and a corresponding reference zone detectable response related to each selected analyte level in the sample and related to the corresponding test zone detectable response to establish a substantially constant total detectable response for a pre-determined range of each selected analyte; and

means for combining the detectable responses from each test zone separately with the corresponding detectable result from the reference zone to determine the selected analyte level in the sample.

2. (Withdrawn) The device of claim 1 wherein the combining means further comprises determining the sum of the detectable response from the reference zone is within a pre-determined range of response.

3. (Withdrawn) The device of claim I wherein the combining means further comprises determining the level of the selected analyte in one zone by comparison to the corresponding total detectable response.

4. (Withdrawn) The device of claim I wherein the combining means further comprises determining the level of the selected analyte using the detectable response in one test zone by comparison to a pre-determined standard.

5. (Withdrawn) The device of claim 1 wherein the combining means further comprises determining the level of the selected analyte using the detectable response in one test zone in comparison to the corresponding detectable response in the reference zone.

6. (Withdrawn) The device of claim 1 wherein the combining means further comprises determining the level of the selected analyte using the detectable response in one test zone in one portion of the pre-determined range of analyte and the corresponding detectable response in the reference zone in a different portion of the pre-determined range of the selected analyte.

7. (Withdrawn) A device for determining the presence of an analyte in a sample, the device comprising:

a first test zone for receiving and contacting the sample and a labeled indicator reagent with a first reagent, the firs reagent reacting in the presence of the sample and labeled indicator reagent to form a first reaction product and a detectable response in the first test zone inversely related to the analyte level in the sample;

a second test zone for receiving and contacting the labeled indicator reagent not reacted with the first reagent with a second reagent, the second reagent reacting in the presence of the labeled indicator reagent to form a second reaction product and a detectable response in the second test zone related to the analyte level in the sample and related to the detectable response of the first test zone to establish a substantially constant total detectable response from the test zones for a pre-determined range of the analyte; and;

means for combining the detectable response from the test zones to determine the analyte level in the sample.

8. (Withdrawn) The device of claim 7 wherein the combining means further comprises determining the sum of the detectable responses from the test zone to be within a pre-determined range of response.

9. (Withdrawn) The device of claim 7 wherein the combining means further comprises determining the level of analyte in one test zone by comparison to the total detectable response.

10. (Withdrawn) The device of claim 7 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone by comparison to a pre-determined standard.

11. (Withdrawn) The device of claim 7 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone in comparison to the detectable response in the other test zone.

12. (Withdrawn) The device of claim 7 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone in one portion of the pre-determined range of analyte and the detectable response in the other test zone in a different portion of the pre-determined range of analyte.

13. (Withdrawn) The device of claim 7 wherein the pre-determined range of the analyte is a concentration of about 0 to about 100 mM.

14. (Withdrawn) A device for determining the presence of an analyte in a sample, the device comprising:

a porous member capable of being traversed by the sample;

a first zone on the porous member for receiving and contacting the sample with a labeled indicator reagent diffusively immobilized on the porous member, the labeled indicator reagent in the presence of the analyte to form a mixture;

a second zone on the porous member for receiving and contacting the mixture with a first reagent non-diffusely immobilized on the porous material in the second zone, the first reagent reacting in the presence of the mixture to form a first reaction product and a detectable response in the second zone inversely related to the analyte level in the sample;

a third zone on the porous member for receiving and contacting the remaining mixture with a second reagent non-diffusely immobilized on the porous material in the third zone, the second reagent reacting in the presence of the remaining mixture to form a second reaction product and a detectable response in the third zone related to the analyte level in the sample; and

means for determining the analyte level in the sample form the detectable responses in the second and third zones.

15. (Withdrawn) The device of claim 14 wherein the device further comprises:

the first zone further receiving and contacting the sample with a second labeled indicator reagent reacting in the presence of a second analyte and included in the mixture;

a fourth zone on the porous member for receiving the mixture, the fourth zone contacting the mixture with a third reagent non-diffusely immobilized on the porous material in the fourth zone, the third reagent reacting in the presence of the mixture to form a third reaction product and a detectable response in the fourth zone inversely related to the second analyte level in the sample;

the third zone receiving and further contacting the remaining mixture with a fourth reagent non-diffusely immobilized on the porous material in the third zone, the fourth reagent reacting in the presence of the remaining mixture to form a fourth reaction product and a detectable response in the third zone related to the second analyte level in the sample; and

means for determining the second analyte level in the sample from the detectable responses in the fourth and third zones.

16. (Withdrawn) The device of claim 14, wherein the porous member is made of a bibulous material.

17. (Withdrawn) The device of claim 16 wherein the bibulous material is in the form of a strip having a proximate end containing the first zone, a central section containing the second zone and a distal end containing the third zone.

18. (Withdrawn) The device of claim 16, further comprising a support for the bibulous material laminated thereto.

19. (Withdrawn) The device of claim 14, wherein:

the labeled indicator reagent is a particle conjugated to a specific binding partner of the analyte, the mixture includes a particle:specific binding partner:analyte conjugate;

the first reagent is the analyte or an analyte-analog, the first reaction product is the particle:specifIc binding partner:first reagent conjugate; and

the second reagent is a first member of a specific binding pair capable of binding to a second member of the specific binding pair on the labeled indicator reagent, the second member of the specific binding pair is not a specific binding partner to the analyte, the second reaction product is a particle:specific binding partner:second reagent conjugate.

20. (Withdrawn) The device of claim 14 wherein:

the labeled indicator is a particle conjugated to the analyte, the mixture includes labeled indicator reagent and analyte;

the first reagent is a specific binding partner to the analyte, the first reaction product is a particle:analyte:specifIc binding partner conjugate;

the second reagent is a first member of a specific binding pair capable of binding to a second member of the specific binding pair on the labeled indicator reagent, the second member of the specific binding pair not being a specific binding partner to the analyte, the second reaction product is a particle:specific binding partner:second reagent conjugate.

21. (Withdrawn) A device for determining the presence of an analyte in a sample, the device comprising:

a bibulous member capable of being traversed by the sample;

a first zone on the bibulous member for receiving and contacting the sample with a particle-linked antigen diffusively immobilized on the bibulous member, the particle-linked antigen reacting in the presence of the analyte to form a mixture;

a second zone on the bibulous member for receiving and contacting the mixture with an antibody non-diffusely immobilized on the bibulous material in the second zone, the antibody being a specific binding partner to the particle-linked antigen and the analyte, the antibody reacting in the presence of the mixture to bind the particle-linked antigen and express a detectable response in the second zone inversely related to the analyte level in the sample;

a third zone on the bibulous member for receiving and contacting the remaining mixture with an antibody non-diffusely immobilized on the bibulous material in the third zone, the antibody being a first member of a specific binding pair capable of binding to a second member of the specific binding pair on the particle-linked antigen, the second member of the specific binding pair not being a specific binding partner to the analyte, the antibody reacting in the presence of the remaining mixture to bind with the remaining mixture and express a detectable response in the third zone related to the analyte level in the sample; and

means for determining the analyte level in the sample from the detectable responses in the second and third zones.

22. (Withdrawn) The device of claim 21 wherein the determining means further comprises determining the sum of the detectable responses from the test zones to be within a pre-determined range of response.

23. (Withdrawn) The device of claim 21 wherein the combining means further comprises determining the level of analyte in one test zone by comparison to the total detectable response.

24. (Withdrawn) The device of claim 21 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone by comparison to a pre-determined standard.

25. (Withdrawn) The device of claim 21 wherein the combining means further comprises determining the level of analyte using the detectable response on one test zone in comparison to the detectable response in the other test zone.

26. (Withdrawn) The device of claim 21 wherein the combining means further comprises determining the level of analyte using the detectable responses in one test zone in one portion of the pre-determined range of analyte and the detectable response in the other test zone in a different portion of the pre-determined range of analyte.

27. (Withdrawn) A device for determining the presence of an analyte in a sample, the device comprising:

a bibulous member capable of being traversed by the sample;

a first zone on the bibulous member for receiving and contacting the sample with a particle-linked antibody diffusively immobilized on the bibulous member, the particle-linked antibody reacting in the presence of the analyte to form a conjugate included in a mixture;

a second zone on the bibulous member for receiving and contacting the mixture with an antigen non-diffusely immobilized on the bibulous material in the second zone, the antigen being a specific binding partner to the particle-linked antibody, the antigen reacting in the presence of the particle-linked antibody and express a detectable response in the second zone inversely related to the analyte level in the sample;

a third zone on the bibulous member for receiving and contacting the remaining mixture with an antibody non-diffusely immobilized on the bibulous material in the third zone, the antibody being a first member of a specific binding pair capable of binding to a second member of the specific binding pair on the particle-linked antibody, the second member of the specific binding pair not being a specific binding partner to the analyte, the antibody reacting in

the presence of the remaining mixture to bind with the particle-linked antibody and express a detectable response in the third zone related to the analyte level in the sample; and

means for determining the analyte level in the sample from the detectable response in the second and third zones.

28. (Withdrawn) The device of claim 27 wherein the determining means further comprises the sum of the detectable responses from the test zones is within a pre-determined range of response.

29. (Withdrawn) The device of claim 27 wherein the combining means further comprises determining the level of analyte in one zone by comparison to the total detectable response.

30. (Withdrawn) The device of claim 27 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone by comparison to a pre-determined standard.

31, (Withdrawn) The device of claim 27 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone in comparison to the detectable response in the other test zone.

32. (Withdrawn) The device of claim 27 wherein the combining means further comprises determining the level of analyte using the detectable response in one test zone in one portion of the pre-determined range of analyte and the detectable response in the other test zone in a different portion of the pre-determined range of analyte.

33. (Withdrawn) A method for determining the presence of an analyte in a test sample, the method comprising the steps of:

contacting the sample with a porous member having a plurality of zones;

transporting the sample sequentially across the plurality of zones and contacting the sample to at least one reagent immobilized in each zone;.

detecting a response for the contact between the sample and the reagent in at least two zones;

determining the analyte level in the sample by combining the response from at least two zones.

34. (Withdrawn) The method of Claim 33, wherein the method further comprises:

reacting the sample with a labeled indicator reagent to generate a mixture prior to the step of transporting the mixture sequentially across the plurality of zones.

35. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

combining the responses from at least two zones to establish a substantially constant total detectable response from the test zones for a pre-determined range of the analyte.

36. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

combining the detectable responses from at least two test zones to determine the sum is within a pre-determined range of response.

37. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

combining the detectable responses from at least two zones to determine a total detectable response and determining the level of analyte in one zone by comparison to the total detectable response.

38. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

comparing the detectable response in one test zone by comparison to a pre-determined standard.

39. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

comparing the detectable response in one test zone in comparison to the detectable response in the other test zone.

40. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

comparing the detectable response in one test zone in one portion of the predetermined range of analyte and the detectable response in the other test zone in a different portion of a pre-determined range of analyte.

41. (Withdrawn) The method of claim 33 wherein the determining step further comprises:

comparing the responses from at least two zones at the inversion of one as to the other with the sum of these responses about constant over the analyte level range.

42. (Withdrawn) The method of claim 33 wherein the detecting step further comprises:

generating a detectable response with a particle for binding with the analyte and immobilized reagents in the zones.

43. (Withdrawn) A method for determining the level of at least one analyte in a sample, the method comprising the steps of

contacting the sample with an end portion of a bibulous strip having a plurality of zones;

wicking the sample to a labeled indicator reagent diffusively immobilized on the bibulous strip;

reacting the labeled indicator reagent in the presence of the analyte to form a mixture;

wicking the mixture to a first reagent non-diffusely immobilized on the bibulous strip;

reacting the first reagent in the presence of the mixture to form a first reaction product and a detectable response inversely related to the analyte level in the sample;

wicking the remaining mixture to a second reagent non-diffusely immobilized on the bibulous strip;

reacting the second reagent in the presence of the remaining mixture to form a second reaction product and a detectable response to the analyte level in the sample;

determining the analyte level in the sample from the detectable responses in the reacting steps with the first and second reagents.

44. (Withdrawn) The method of claim 43 wherein:

the wicking step with the sample further comprises wicking the sample to a second labeled indicator reagent diffusively immobilized on the bibulous strip;

the reacting step with the labeled indicator reagent further comprises reacting the second label indicator reagent in the presence of a second analyte and included in the mixture;

the method further comprising:

wicking the mixture to a third reagent non-diffusely immobilized on the bibulous strip;

reacting the third reagent in the presence of the mixture to form a third reaction product and a detectable response inversely related to the second analyte level in the sample;

wicking the remaining mixture to a fourth reagent non-diffusely immobilized on the bibulous strip;

reacting the fourth reagent in the presence of the remaining mixture to form a fourth reaction product and a detectable response related to the second analyte level in the sample;

determining the second analyte level in the sample from the detectable responses in the reacting steps with the third and fourth reagents.

45. (Withdrawn) The method of claim 43 wherein:

the reacting step with the labeled indicator reagent further comprises forming a particle:specific binding partner:analyte conjugate;

the reacting step with the first reagent further comprises forming a particle:specific binding partner:first reagent conjugate; and

the reacting step with the second reagent further comprises binding a first member of a specific binding pair to a second member of the specific binding pair on the labeled indicator reagent, the second member of the specific binding pair not being a specific binding partner to the analyte.

46. (Withdrawn) The method of claim 43 wherein:

the reacting step with the labeled indicator reagent further comprises forming a mixture including labeled indicator reagent and analyte;

the reacting step with the first reagent further comprises forming a particle:analyte:specific binding partner conjugate;

the reacting step with the second reagent further comprises binding a first member of a specific binding pair to a second member of the specific binding pair on the labeled indicator reagent, the second member of the specific binding pair is not a specific binding partner to the analyte.

47. (Withdrawn) The method of claim 43 wherein:

the reacting step with the labeled indicator reagent comprises forming a mixture including particle-linked antigen with the analyte;

the reacting step with the first reagent comprises binding an antibody with the particle-linked antigen and the analyte

the reacting step with the second reagent comprises binding a first member of a specific binding pair to a second member of the specific binding pair on the particle-linked antigen, the second member of the specific binding pair is not a specific binding partner to the analyte.

48. (Withdrawn) The method of claim 43 wherein:

the reacting step with the labeled indicator reagent comprises forming a mixture including a particle-linked antibody with the analyte;

the reacting step with the first reagent comprises substantially binding the particle- linked antibody with an immobilized antigen;

the reacting step for the second reagent comprises binding a first member of a specific binding pair to a second member of the specific binding pair on the particle-linked antibody, the second member of the specific binding pair is not a specific binding pair to the analyte.

49. (Withdrawn) An analytical assay instrument comprising the assay device of claim 1, a housing, and the following components contained within said housing:

Visually readable output means,

A detector means in electrical or optical communication with any one or all of the test and reference zones, wherein said detector means is responsive to a physically detectable change and produces an electrical signal which is correlated to the amount of indicator in the test and reference zones; and

Signal processing means connected to the detector means for converting the electrical signal to a digital test result output;

Wherein said visually readable output means is connected to the signal processor means for receiving and presenting the digital test result output.

50. (Withdrawn) The analytical assay instrument of claim 49, wherein said assay device is also contained within said housing

51. (Previously Presented) A dry reagent lateral flow strip assay device for detecting at least one analyte in a test sample within a pre-determined range of analyte concentration using a porous member capable of being traversed by the sample comprising:

a) a sample application zone on the porous member having diffusively immobilized therewith a labeled indicator reagent;

b) at least one test zone having non-diffusively bound thereto a first reagent that forms a first reaction product and a corresponding test zone detectable response inversely proportional to the analyte concentration;

c) at least one reference zone having non-diffusively bound thereto a second reagent that forms a second reaction product and a corresponding reference zone detectable response directly proportional to the analyte concentration;

wherein the sample application zone, the test zone and the reference zone are in fluid communication with one another through the porous member; and

wherein the test zone detectable response plus the reaction zone detectable response equal a total detectable response that is substantially constant for the pre-determined range of analyte concentration.

52. (Previously Presented) The assay device of claim 52, wherein the porous member further comprises a bibulous solid phase material.

53. (Previously Presented) The assay device of claim 52, wherein the porous member further comprises fiberglass, cellulose or nylon.

54. (Previously Presented) The assay device of claim 51 for detecting multiple analytes in a test sample, further comprising more than one test zone, each corresponding to an analyte.

55. (Previously Presented) The assay device of claim 51, wherein the porous member further comprises more than one bibulous material , wherein the sample application zone, the test zone and the reference zone are in fluid communication therethrough.

56. (Previously Presented) The assay device of claim 51, further comprising one or more reagents diffusively or non-diffusively bound to the porous member selected from the group consisting of: antibodies, antigens, enzymes, substrates, small molecules, proteins, viral lysate, bacterial lysate, receptors, sugars, carbohydrates, polymers and detergents.

57. (Previously Presented) The assay device of claim 51, further comprising a sample filtration member.

58. (Previously Presented) The assay device of claim 51, wherein the labeled indicator reagent is a particle-linked antigen or a particle linked antibody.

59. (Previously Presented) The assay device of claim 51, wherein the first reagent is an antibody or an antigen.

60. (Previously Presented) The assay device of claim 51, wherein the second reagent is an antibody that binds to the labeled indicator reagent to form the second reaction product.

61. (Withdrawn) A method of performing a dry reagent lateral flow strip assay for detecting at least one analyte in a test sample within a pre-determined range of analyte concentration comprising the steps of:

a) providing a porous member capable of being traversed by the sample, wherein the porous member further comprises:

i) a sample application zone on the porous member having diffusively immobilized therewith a labeled indicator reagent;

ii) at least one test zone having non-diffusively bound thereto a first reagent that forms a first reaction product and a corresponding test zone detectable response inversely proportional to the analyte concentration; and

iii) at least one reference zone having non-diffusively bound thereto a second reagent that forms a second reaction product and a corresponding reference zone detectable response directly proportional to the analyte concentration;

b) contacting the sample application zone with the sample; and

c) detecting the test zone detectable response and the reagent zone detectable response, wherein the test zone detectable response plus the reaction zone detectable response equal a total detectable response that is substantially constant for the pre-determined range of analyte concentration.

62. (Withdrawn) The method of claim 61, wherein the test sample is derived from whole blood, whole blood components, ascites, urine, sweat, milk, synovial fluid, peritoneal fluid, amniotic fluid or cerebrospinal.

63. (Withdrawn) The method of claim 61, wherein the analyte is an antigenic substance selected from the group consisting of: a protein, a peptide, an amino acid, a hormone, a steroid, a vitamin, a drug, a bacterium, and a virus.

64. (Withdrawn) The method of claim 61, wherein the total detectable response is a form of electrical conductance, reflectance of a characteristic light wavelength, or absorption of a characteristic light wavelength.

65. (Withdrawn) The method of claim 61, wherein the porous member further comprises a bibulous material with proximal and distal ends.

66. (Withdrawn) A system for performing a dry reagent lateral flow strip assay for detecting at least one analyte in a test sample within a pre-determined range of analyte concentration comprising:

a) a porous member capable of being traversed by the sample, wherein the porous member further comprises:

i) a sample application zone on the porous member having diffusively immobilized therewith a labeled indicator reagent;

ii) at least one test zone having non-diffusively bound thereto a first reagent that forms a first reaction product and a corresponding test zone detectable response inversely proportional to the analyte concentration; and

iii) at least one reference zone having non-diffusively bound thereto a second reagent that forms a second reaction product and a corresponding reference zone detectable response directly proportional to the analyte concentration; and

b) an assay instrument that measures the test zone detectable response and the reference zone detectable response

67. (Withdrawn) The system of claim 66, wherein the assay instrument further comprises a reflectance meter or a transmission meter.